REMARKS

Claims 1-26 are pending in the application. Claims 20-25 have been withdrawn pursuant to an election of species requirements. Claims 1-14, 27, and 28 have been cancelled by this amendment without prejudice. No claims are presently allowed.

In the event that this response does not place the application in condition for allowance, Applicants request the opportunity of an interview with the Examiner before a final rejection is mailed.

Claim Rejections – 35 U.S.C. § 112

The Examiner rejected claims 27 and 28 under 35 U.S.C. § 112, first and second paragraphs. These claims have been cancelled without prejudice to obviate this rejection.

Claim Rejections – 35 U.S.C. § 103

The Examiner rejected claims 15, 17-19, and 26 under 35 U.S.C. § 103(a) as being unpatentable over Joyce (US 5,292,559) in view of Axtell (US 6,238,847).

The invention of claim 15 is a method for creating a deposit of a material of interest on a receiving substrate. A first laser is directed through the target substrate having a coating that comprises a source material that can be transformed into the material of interest to cause the source material to be removed from the surface of the support and deposited on a receiving substrate. A second laser is directed to strike the deposited source material to transform the source material into the material of interest.

Axtell discloses a method of marking a substrate by applying a marking material to the surface of the substrate, irradiating a portion of the marking material with a laser, and removing the non-irradiated portion of the marking material (abstract). The irradiated portion is adhered to the substrate (col. 3, lines 4-5).

Joyce discloses a method of laser transfer using a laser transparent substrate with a laser absorptive polymer film and a metal containing composite on the film (abstract). The transferred

composite is pressure bonded or cold welded to the substrate (col. 3, lines 26-27).

Applicants continue to assert that Axtell and Joyce cannot be combined to produce the present invention and that there is no rational way to combine them at all. The Examiner stated that Joyce teaches the transfer of a source material (office action of 05/01/2003, page 3, lines 12-16). However, "source material," as defined in the present invention is a material that can be transformed into the material of interest (claim 15). Joyce uses a material that is specifically not transformed (col. 4, lines 1-5). Joyce does not use a source material. The rejection of claim 15 does not establish how the references can be combined to produce the present invention.

Applicants also contend that, even if Axtell and Joyce could be combined, there is no motivation found in the references to do so. The Examiner stated that motivation exists in that Joyce teaches the desire that the coating be strongly adhered, and that it would have been obvious to use a second laser, according to the method of Axtell, to irradiate the applied layer of Joyce, achieving permanent adhesion. It is believed that the Examiner is stating that the "permanent" adhesion of Axtell is an improvement over the "excellent" adhesion of Joyce.

Applicants contend that no conclusion can be drawn as to whether Joyce or Axtell achieves better adhesion. The terms "excellent" and "permanent" are used in different contexts. The method disclosed in Joyce is capable of producing transferred material with a wide range of adhesion strengths (col. 5, Table I). The adhesion is characterized as marginal, acceptable, good, better, and best. The general trend is that adhesion improves with decreasing spot size and increasing energy density. Joyce also states that "by the use of a high energy density, ... it was possible to achieve excellent adhesion and desirable spot shape definition." (Col. 3, lines 32-35.) Joyce continues with "In U.S. Pat. No. 4,987,006, it was believed that an energy density of 7 J/cm^2 was sufficient to effect pressure bonding or cold welding of gold to a copper substrate or workpiece. Through further research, it was discovered that to achieve good adhesion and imaging, ... much higher energy densities were required, ... [s]pecifically, ... about 8 J/cm^2 to about 20 J/cm^2, with a preferred smaller window of from about 12 J/cm^2 to about 18 J/cm^2."

(Col. 5, lines 33-44.) It appears that the term "excellent" is used either to describe certain examples from Table I that have better adhesion than other examples, or to compare the new method with the similar prior art method. No measured adhesion strengths are disclosed, nor is any method of determining the qualitative adhesion ratings disclosed. This is despite the fact that such methods, such as scratch tests and force measurements, are known in the art.

In Axtell, the term "permanent marking" means "a non-temporary marking which, for example, possesses relatively high wear resistance, corrosion resistance and/or fading resistance." (Col. 9, lines 32-34.) "Permanent" is used in the context of converting a temporary coating that is easily removed to a permanent coating that is not easily removed. The definition appears to state that "permanent" does not mean absolutely permanent. (It is probably impossible to make a truly permanent marking that could not be removed by any means.) It can even be argued that the "relatively high" properties of Axtell are not as good as the "excellent" adhesion of Joyce. As in Joyce, no measured adhesion strengths are disclosed.

There is no disclosed basis to assume that Axtell would improve the adhesion of Joyce. There are no adhesion strengths to compare and the qualitative descriptions are inconclusive. There is, however, a basis to conclude that the Axtell method would actually degrade the coating of Joyce. When pure metals are used in Axtell, it is disclosed to use them only in powder form (col. 7, Table 1, lines 20-28). The metal powder is sintered by the laser (col. 9, lines 25-27). Axtell does not disclose irradiating a continuous metal mass, as is used in Joyce. Irradiating such a metal mass would likely be detrimental. The melted metal could flow and reduce definition. Melting may also create thermal stresses between the metal and the substrate resulting in debonding. The attached article, Tomsia, "Behavior of Liquid Metals on Ceramic Surfaces Explained," Lawrence Berkeley National Laboratory (2002), shows that wetting by liquid metals was not well understood. As adhesion is highly dependent on wetting, it cannot be concluded that melting the metal using the method of Axtell would improve the adhesion. The adhesion may even be made worse.

Joyce discloses the transfer of solid gold, not a powder (col. 3, lines 65-67). There is no need for sintering. Performing the method of Axtell on the transferred coating of Joyce would be detrimental to the coating. Joyce also teaches away from performing any further processing. "Since the gold is never vaporized or melted in this case, aspects of structure, such as smoothness, continuity, composition or multiple layers that were present in the noble metal film or composite before transfer, can be maintained." (Col. 4, lines 1-5). Using the method of Axtell could alter this structure, but Joyce states that maintaining this structure is important.

Further, Joyce teaches that the energy density of the transferring laser should be from 8 to 20 J/cm^2 (col.5, lines 40-42). Although the present claims are not to be construed as limiting the energy density of the laser to any range, the range disclosed in Joyce would likely be detrimental to the source material of the present invention. The source material is to be converted to a material of interest. The use of high energy densities as in Joyce may convert the source material to the material of interest before it is transferred to the receiving substrate. The solid gold coating of Joyce is less likely to be affected by these high energy densities. The present application discloses an example energy density of only 0.01 to 1 J/cm^2 (page 14, line 19), which is orders of magnitude less than the range disclosed in Joyce.

As to claims 18 and 19, the Examiner has stated that since the polymer film causes the transfer, and not the transfer material itself, the identity of the transfer material of Joyce is not crucial to the success of the method (office action, page 4, lines 14-16). Applicants respectfully disagree with this statement. Even if a portion of the polymer film of Joyce is not vaporized, a significant amount of heat may be transferred through the film and into the transfer material. As Joyce is only concerned with gold and gold composites, this heat may not effect the transfer material of Joyce. However, there could be an effect on the source materials of the present invention. As explained above, the source material could be transformed into the material of interest before it is transferred. There is not a reasonable expectation of success that a mixture of organometallic compound and metal powder may be transferred using the method of Joyce.

Claim 17 depends from and contains all the limitations of claim 15 and is asserted to distinguish from the references in the same manner as claim 15. Claim 26 differs from claim 15 only in that it recites a "pulsed laser beam" and a "laser beam" instead of a "first laser" and "second laser," and is asserted to distinguish from the references in the same manner as claim 15.

The Examiner rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Joyce in view of Axtell, and further in view of Baum (US 5,220,044).

Baum discloses a method of chemical vapor deposition onto a substrate by heating the substrate. The heating may be performed by a laser (col. 3, lines 7-9).

Claims 16 depends from and contains all the limitations of claim 15 and is asserted to distinguish from the references in the same manner as claim 15. In addition, Baum does not disclose the step of pretreating the receiving substrate by positioning the first laser or the second laser so that it strikes the receiving substrate before the source material is deposited thereon. In Baum, the substrate is heated by the laser contemporaneously with deposition of material. It is this heating that causes the deposition. However, in the invention of claim 16, the laser pretreatment must occur before the transfer of the source material. The pretreatment does not cause any transfer of material. If the pretreatment did occur during the transfer, the pretreating laser beam would strike the source material before it reached the receiving substrate. This could begin the transformation of the source material into material of interest and cause undesirable results.

The Examiner has not cited a motivation that is found in the references, but has only stated the conclusion that the combination is obvious. The recent case *In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338 (Fed. Cir. 2002) reviewed the requirements for finding a motivation to combine references. In that case, the Board of Patent Appeals and Interferences had held that the "conclusion of obviousness may be made from common knowledge and common sense of a person of ordinary skill in the art without any specific hint or suggestion in a particular

reference." *Id.* at 1432. The Federal Circuit reversed, holding that the Board may not reject the need for "any specific hint or suggestion in a particular reference." *Id.* at 1434. Neither has the Examiner made a finding as to the level of skill in the art or the likelihood of success, as required under MPEP 2141.03 and 2143.02.

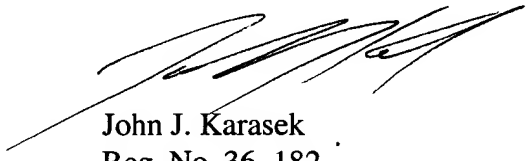
Double Patenting

The Examiner repeated the double patenting rejection from the previous office action of claims 15 and 26 over Chrisey (US 6,177,151) in view of Axtell. Attached is a terminal disclaimer to obviate this rejection, without admitting any obviousness of the claimed invention.

In view of the foregoing, it is submitted that the application is now in condition for allowance.

In the event that a fee is required, please charge the fee to Deposit Account No. 50-0281, and in the event that there is a credit due, please credit Deposit Account No. 50-0281.

Respectfully submitted,



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